

Appln No. 10/089,577
Amdt date August 10, 2004
Reply to Office action of June 16, 2004

REMARKS/ARGUMENTS

Claim 36 is amended as suggested in the Office action. Reconsideration and reexamination of this application are requested.

Responsive to the Office action of June 16, 2004, claims 1, 3, 5, 16, 36 and 42 have been amended and claims 54 and 55 are added. The amendment to claim 3 corrects a misspelling. Claim 54 is former claim 1 with amendments different from those made hereby to claim 1. Claim 55 is substantively claim 6 (not cancelled) rewritten in independent form.

The Office's withdrawal of the earlier restriction requirement is noted with appreciation. Also, the formal allowance of claims 7-15, 36-41 and 49-53 and the statement that claims 6, 17-35 and 44-48 are drawn to allowable subject matter are noted. Only claims 1-5, 16, 42 and 43 are in issue.

The action contains no information as to why objection has been made to the specification, and so applicants are unable to address any such objection.

The Relevant Disclosure of Woolslayer et al. '086

As shown best in Figs. 1 and 4-8 of Woolslayer '086, that reference pertains to a multilevel drill pipe storage rack in which plural horizontal pipe receiving trays 5 are vertically stacked atop each other at two spaced stations associated with parallel horizontal support beams 3. Each tray 5 has plural upwardly open recesses at intervals along its length for receipt of a drill pipe length or "stand". At each station, a bottom tray is slidably carried atop the respective beam 3 for movement of the tray lengthwise along the length of the beam. Three

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additional trays are disclosed at each station; a first one is aligned atop the bottom tray and is slidable therealong, and the second one is aligned atop the first one and is slidable therealong, and similarly as to the third one which is slidable along the bottom tray.

When the two sets of trays 5 are fully loaded by pipe lengths, the trays are all located to one side of a vertical plane in which are located principal elements of a pipe transfer arm system. That vertical plane also includes the vertical working axis of a drilling derrick which is the place of ultimate use of pipe lengths stored in the rack. The pipe transfer arm system includes a pair of pivoted arms 23 which carry pipe support shoes 25 at ends opposite from the arm pivots; the arms 23 are interconnected by a link 26. The pivot arms 23 are moved by operation of a ram 27 connected to one of the arms. Fig. 5 shows very clearly that shoes 25, at the ends of arms 23, are movable into contact with the bottom of a given pipe length, for lifting of the pipe length from its supporting trays, when the pipe length has been moved to lie in the vertical plane in which shoes 25 are located.

As explained in the '086 patent, a beginning state of the pipe storage system there disclosed is a state in which all of trays 5 are loaded with pipe lengths and all trays are to the right side of shoe 25 as seen in Fig. 5. In that state, the several pipe lengths are disposed in a multilayer array, with plural pipe lengths in each layer, to the right of the lift mechanism plane in which shoe 25 is located. The first pipe length is removed from the top tray by indexing the top tray to

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the left by one interpipe interval, thereby placing the pipe in the principal vertical plane above shoes 25 which are displaced in that vertical plane literally from the tray stacks. The lift mechanism is then operated to lift that pipe from the top tray. The top tray is again indexed to the left to place the second pipe in the principal vertical plane for engagement, at the bottom of the pipe, by the lift mechanism. As the top tray moves leftward in increments, its left end enters into a receiver (element 13, e.g.) on the left side of the principal plane, and is supported on a pair of ledges 14 (Fig. 7) in the tray receiver. Ultimately, the top tray is emptied of pipe lengths, at which point the top tray is entirely on the left side of the principal plane in the tray receiver.

The top tray will have been moved fully into the tray receiver by operation of the ratchet-action drive mechanism shown in Figs. 5 and 8 and comprised by cam 16, 17 and associated elements 18-21; see the '086 patent at column 2, lines 29-63. Once the top tray is in the receiver, the drive mechanism is manually disconnected from the top tray and moved into connection with the next lowest tray at the right end of that tray. As so relocated, the tray drive mechanism is engaged between the second tray and the one below it; see the '086 patent at column 4, lines 4-8. The second tray can then be incrementally indexed leftward across the principal plane into the tray receiver, with one pipe length being lifted by shoes 25 from below out of that tray at the end of each step in the leftward movement of the tray. In such pipe-unloading motion of the trays, the tray drive mechanism operates to push the trays.

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When pipes are to be moved from the derrick into an empty set of trays, the tray drive mechanism is reconfigured so that it cooperates between the right end of the bottom tray and the structure which supports the bottom tray on the right side of the principal plane. As reconfigured, the tray drive operates to pull trays from the tray receiver leftward, in stepwise manner, back into the tray position shown in Fig. 5. See the '086 patent at column 4, lines 17-29.

In view of the foregoing, Woolslayer et al. '086 teaches several things which are relevant to the allowability of claims 1, 5, 16, 42 and 54. Those things include the following:

1. The array in which pipes are located when supported in trays 5 is an array which must vary in geometry and in location. It is not a stationary array. It is an array in which its several layers must shift laterally as pipes are unloaded from the array or are loaded into the array.

2. The several pipe receivers (trays 5) do not have fixed positions in the array. Each tray must be laterally movable while supporting pipes, else the disclosed system will not operate.

3. The several trays must be movable between fully deployed (full array) and fully retracted (empty array) positions while each tray has pipes carried by it.

Reasons Why Applicants' Claims Are Allowable

Claim 1 states that, in the pipe storage apparatus there described, the array of pipe storage locations has plural vertically spaced layers which are stationary. Claim 1 also states that the pipe support members have substantially fixed

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deployed positions in the array. The pipe racking system of the Woolslayer et al. '086, to be operable as described, must have laterally movable layers of pipe in its array of racked pipes; to provide that lateral movability of pipe layers, the pipe support trays 5 of the '086 patent cannot have substantially fixed positions in the array of racked pipes - trays 5 must be movable as they support racked pipe lengths. Thus, the '086 patent teaches away from the subject matter of claim 1, wherefore claim 1 cannot be anticipated or made obvious by the content of the '086 patent. Claim 1 is allowable, as are claims 2-4 which are dependent on claim 1.

The amendment to claim 3 corrects an apparent spelling error and has nothing to do with issues of patentability.

Claim 5 states that the lowermost pipe support member, at each of the plural stations along the pipe storage bin where there are pipe support members, is substantially immovable. In the pipe racking apparatus of the '086 patent, the lowermost pipe support tray 5 at each station is movably carried on supporting structure; see the '086 patent at column 2, lines 13-18:

"Each tray is movable lengthwise relative to the one supporting it, and the bottom tray is movable along base 8. This movement is accomplished by indexing means that slide the trays forward across the transfer zone one step at a time as will be described presently."

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The '086 patent teaches away from the structure described in claim 5 and so can neither anticipate nor have made obvious that claimed structure.

Claim 5 states that in addition to the lowermost pipe support member at each station, there are other support members. The claim also states that there are selectively operable drive mechanisms coupled to respective other support members to move those members between deployed positions in the array of pipe support locations and retracted positions removed from the array. In that respect, claim 5 confirms that the lowermost pipe support members at each station are not movable, and it also further distinguishes over the '086 patent. The '086 patent teaches that, at each station where trays 5 are located, there is a single tray indexing means (see elements 16-21 in Figs. 5 and 8) which must be manually moved in the apparatus as each tray either is filled or is emptied. The '086 patent does not suggest that each movable tray have a drive mechanism associated with it. Claim 5 patentably defines over the '086 patent.

Claim 6 remains in the application as a claim dependent on claim 1. The action of June 16, 2004 merely objected to claim 1 as being dependent on a rejected claim. New claim 55 is claim 6 rewritten in independent form with original claim 1 as the foundation. Claim 55 is allowable.

Claim 16 describes an apparatus in which the pipe support members have deployed positions in which they are stationary in the array (of supported pipes). As noted above, the '086 patent describes a pipe racking arrangement which becomes inoperative

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if its pipe support members (trays 5) are stationary. Claim 16 patentably defines over the Woolslayer et al. '086 patent and is allowable as are claims 17-35 which are dependent.

Furthermore, as to claim 16, it describes a combination which includes a pipe lifter disposable above the array of supported pipes; the pipe lift mechanism of the '086 patent engages a supported pipe from below; see roller element 25 in Fig. 5. The claimed pipe lifter operates to move individual pipe lengths between the array and a transfer position laterally of the array. In no case does the apparatus described in the '086 patent move a pipe laterally once the pipe has been raised from its supported position in the array. This further aspect of claim 16 also patentably distinguishes that claim from the disclosures of the '086 patent.

Claim 42 is a method claim which includes the step of "raising and lowering individual pipe lengths directly from above from and to receiving notches in the pipe supports". As noted above, shoes 25 in the '086 patent's system move from below a suitably positioned pipe length into and out of supporting contact with that pipe length. Claim 42 patentably distinguishes over the '086 patent.

Claim 54 is new and is a variation of claim 1. Claim 54 states that the pipe support members have connected to them selectively operable drive mechanisms which operate to move the pipe support members individually only when the members are empty of drill pipe. The pipe support trays 5 described in the '086 patent must be moved while they carry drill pipe, else the

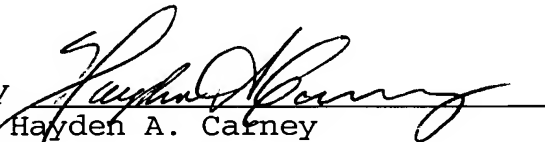
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pipe lengths cannot be lifted from the trays. Claim 54 is allowable over the disclosures of the '086 patent.

As shown above, all claims rejected in the Office action of June 16, 2004 now patentably distinguish over the references applied in those rejections. Also, newly added claims 54 and 55 have been shown to be allowable. Formal allowance of this application is solicited.

Respectfully submitted,
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